or less popular treatises on the subject is not surprising. Most of the original memoirs are in technical language in serials that are not generally accessible, and it is natural that critical summaries by those who have taken part in such research should be widely welcomed. The curiosity of the intelligent public, however, is so eager for satisfaction in many matters which are still beyond the pale of scientific knowledge that there is ever a temptation to make a book successful by pandering to this taste. Probabilities and possibilities which have been judiciously considered in scientific memoirs, and rightly used as tentative hypotheses, run the risk of being quoted as established facts; while unique, isolated discoveries tend to be treated as if they were sufficient for the absolute determination of their mutual relationships and could be used for definite conclusions.

We venture to think that Prof. H. F. Osborn has sadly failed to resist this temptation in his new handsome volume on the "Men of the Old Stone Age," which has reached a second edition in America within six months of its original publication. In every respect it is in strange contrast with such works as Huxley's well-known "Man's Place in Nature," which Prof. Osborn curiously omits both from his historical sketch and from his valuable bibliography of the subject. We are definitely told that modern geology "has firmly established eight subdivisions or stages of Pleistocene time—namely, four Glacial, three inter-Glacial, and one post-Glacial," which can be recognised in America as well as in Europe. We learn with equal certainty that Piltdown man is "four times as ancient as the final type of Neanderthal man," while Heidelberg man is nearly twice as ancient as the Piltdown man, "according to our estimates." The gravels in which Galley Hill man was found "are by no means of the geologic antiquity of 200,000 years assigned to them by Keith," but "lie within the estimates of post-Glacial time—namely, from 20,000 to 40,000 years." In fact, the dates of the successive stages in prehistoric man's progress are so exactly given and so often repeated that they cannot fail to deceive the unwary reader, who must feel especially impressed by their precision when he notes Prof. Osborn's warning that the odd 1900 years of the Christian era must be added to each statement when he desires to reckon time from the present day.

Prof. Osborn has, indeed, attempted with great labour to present a connected story which is distinctly premature, and will give the ordinary reader an exaggerated idea of the value of the conclusions already reached in prehistoric research. With the aid of several industrious compilers, whose services he acknowledges, he has produced a most useful and up-to-date compendium of the facts, with references to the original papers on which his statements are based. Each section is also most profusely and beautifully illustrated, often with original photographs which were made on a tour through France and Spain. We feel, however, that the collected materials have not been used with sufficient scientific discretion and adequate literary skill to produce a satisfying result. We would only add that for those to whom much of the text may prove difficult reading, the illustrations with their legends will still be a source of instruction and delight, while the excellent chapters on later Palæolithic art will be particularly appreciated. A. S. W.

THE NATURAL HISTORY OF HAWAII.

Natural History of Hawaii: Being an Account of the Hawaiian People, the Geology and Geography of the Islands, and the Native and Introduced Plants and Animals of the Group. By Prof. W. A. Bryan. Pp. 596. (Honolulu: The *Hawaiian Gazette* Co., Ltd.; London: G. E. Stechert and Co., 1915.)

THE suspicion that is awakened by the somewhat typical "American" puff that Prof. W. A. Bryan allows himself in the preface to the "Natural History of Hawaii" is dissipated when the book itself is read, and the author is to be congratulated on having produced a book that is at the same time readable, useful, and trustworthy. It gives the reader a very good general idea of the geology, geography, flora, fauna, and ethnology of the group, and it will be of especial value to residents who take an interest in the local natural history. There is a very large number of photographs, some of which are on too small a scale to be of any real use, while the details in others are lost on account of ordinary photographic, instead of orthochromatic (or similar), plates having been used. The voluminous indices are of great practical use.

The section on the people is disappointing in some respects; for example, it is futile in a popular book to say that "North, South, and Middle America, as well as Papua, Malay, China, Japan, and India, have each in turn been declared the cradle" of the Polynesian race, as the uninformed will be led to suppose that any of these alternatives is possible. We know more on this subject than the author admits to be probable. In view of the recent investigations into the problems of Polynesian ethnology, Prof. Bryan might have alluded to Dr. H. Allen's "Study of Hawaiian Skulls" (*Trans. of Wagner Free Inst. of Sci.*, Phil., v., 1898, p. 1), where a dual element in the population is demonstrated, though the conclusions thereon are possibly erroneous.

In dealing with the flora and fauna the author never loses sight of the problems of distribution; thus not only are the characteristics of the seashore, lowlands, and mountains described, but the variation that occurs from island to island and the significance of this are duly noted. In the case of the land snails, for example, great variation may occur, not only in different valleys, but in parts of the same valley, so that the Hawaiian group is a famous field for the student of variations.

Another good feature of the book is the careful manner in which native species are distinguished

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from introduced species. Those who read the early reports by Dr. Perkins, of the British Association Committee, will remember how rapidly the endemic insects were being replaced by foreigners which had been introduced accidentally; this book deals with a further phase of that sad drama. We all know how successful the Americans of the United States have been in dealing with the problems of economic entomology, and in Hawaii this experience has proved most beneficial, for not only have the enemies of pests been acclimatised, but in the importation of insects to combat the spread of the injurious Lantana we have, we are told, "the first example in the world of the introduction of insects to prevent the spread of a plant." If one more grumble may be permitted, we would like to express surprise that any scientific man should adopt the popular but erroneous spelling for coconut; but to avoid an unpleasant concluding sentence it may be pointed out that all through the book there are occasional references to the ethnological aspect of certain plants and animals which are of interest to the ethnologist.

COLLOID-CHEMISTRY.

A Handbook of Colloid-Chemistry. The Recognition of Colloids, and their General Physico-chemical Properties. By Dr. Wolfgang Ostwald. Translated by Prof. M. H. Fischer. Pp. xii+278. (London: J. and A. Churchill.) Price 12*s*. 6*d*. net.

It is stated in the preface that this book has passed through three large editions in Germany. We are inclined to think that such success was due more to the fact that it was first in the field as a general treatise upon a subject which was attracting widespread interest than to intrinsic merit. The ideas especially of the general theoretical portion are superficial, and the writing loose, words being mistaken for ideas. It is stated more than once, for instance, that the colloid state is independent of chemical composition. Taken literally, the statement is merely foolish. How foolish two examples will suffice to show. Azomethane, one of the most remarkable of colloid substances, loses its colloidal properties if a single hydrogen atom of its complex molecule is replaced by a halogen. Gold, silver, and platinum readily form colloidal solutions in solvents which contain a replaceable hydrogen atom, while the base metals form such solutions in hydroxyl-containing solvents. The author, however, does not really mean what he says. His many pages on the subject show that the thesis he is actually defending is the quite harmless one that for every substance some other substance can probably be found with which it will form a colloidal mixture.

The colloidal state is, to use Bredig's happy phrase, a microheterogeneous state of matter. It is the great merit of Picton and Linder that they made this clear. Dr. Ostwald characterises the different parts as "phases," and speaks of colloids as multiphasic systems. This is an unfortunate use of the word "phase," which Gibbs defined as a portion of matter "uniform throughout, not only in chemical composition, but also in its physical state." Probably the last thing we can claim for portions of matter of microscopic, and especially ultramicroscopic, dimensions is that they are physically homogeneous throughout. The misuse of the word "component" on p. 36, where it is confused with "phase," is probably an error of translation.

The least satisfactory part of the book is the section on surface energy. Here the author, by a series of unsound analogies, introduces unnecessary confusion in a region which Gibbs, Rayleigh, and van der Waals had reduced to order. The part dealing with special properties of colloidal solutions, such as molecular weight, viscosity, osmotic pressure, etc., gives, on the whole, a clear account of the work which has been done.

OUR BOOKSHELF.

The Practical Principles of Plain Photo-micrography. By George West. Pp. xii+145 +plates viii. (Dundee: University College, George West, 1916.) Price 4*s*. 6*d*. net.

In this book plain and practical directions are given for the preparation of photo-micrographs with the use of powers up to a ¼-inch objective. The author very rightly insists that the beginner should commence with low powers, and as he gains experience proceed step by step to the use of the higher powers. A feature of the book is its "common sense": the tyro is not bewildered by a mass of details and scores of chemicals and solutions, but just a few are chosen and fully described which the author has used and found suitable, and throughout directions are given for the adaptation of simple apparatus to the end in view.

After a few pages of general introduction the subjects of microscope and powers, illuminants, colour screens and camera are dealt with; then follow sections on photo-micrography with a landscape camera, without a camera, and with a vertical camera. Next the details of the making of a photo-micrograph from beginning to end are given in dialogue form in the Sandford and Merton style, a method of instruction which personally we do not care for, but which enables the author to give many "tips."

The book is illustrated with two plates showing arrangement of apparatus and six other plates, each with two figures, reproductions of photo-micrographs of various objects. These are described in the text, and a very full table is given of all the details respecting them—nature of the object and its staining, lens, illuminant, screen, plate, exposure, developer, etc. These should be very useful, giving the beginner just the information he wants. Finally, lists of necessaries, photographic formulæ, books on photo-micrography (which might have been priced with advantage), and an index complete the book.

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